

REMARKS

Claims 1-12 and 14-32 are pending, and stand rejected.

Claims 1-4, 6-8, and 10-12, and 14-31 have been amended.

The Examiner has indicated that claim 12 would be allowable if rewritten to overcome Examiner's rejection.

Reconsideration of claims 1-12 and 14-32, as amended, is requested.

A Request for Continued Examination is being filed herein.

The Examiner has objected to claims 1-9 and 29-32 on the grounds of informality or being incomplete for omitting essential elements.

The Applicant has amended claim 1 to correct the informalities and believes that the claim as amended overcomes the objections.

The Examiner has objected to the drawings under 37 C.F.R. 1.83(a), for not disclosing "mounting holes" in the specification.

The Applicant has amended claims 10 and 21 to recite "contact holes" as disclosed in the specification (page 3, lines 21-22). This amendment is believed to overcome the drawing objections, and hence amended or new drawings have not been provided with this response.

The Examiner has rejected claims 5-6, 10-11, 14-16, and 20-24 under 35 U.S.C. 112, first paragraph, on the grounds that the claims fail to comply with the enablement requirement.

The Applicant has amended claims 10, 20 and 21 to clarify the subject matter, namely to recite that the contact holes or vias allow air to flow through. Claim 5 does not recite contacts or connectors inserted into the holes or vias, and therefore claim 5 is sufficiently enabled as previously presented.

The Applicant has amended claims 10 and 12 to overcome the Examiner's rejection based on insufficient antecedent basis and as being indefinite, respectively.

The Examiner has indicated that claim 12 would be allowable if rewritten to overcome Examiner's rejection. Applicant believes the amendment to claim 12 overcomes the rejection.

Claims 1, 3-4, 7, 17-18 and 29-32 stand rejected under 35 U.S.C. 102(e) according to Pape et al. (U.S. Patent No. 6,514,103).

Applicant discloses a heat removal device for electrical equipment including a power connector.

The Applicant has amended claims 1, 3-4, 7, 17-18 and 29-31 to more clearly recite other novel aspects and to facilitate bringing this case to allowance.

Claim 1 has been amended to recite

“A connector, comprising:

... a passageway extending completely through the connector from the second side to the third side for promoting air flow across the upper and lower surfaces of the conductors and through the housing.”

Pape discloses a channel for circulating a flow of heated gas through the interior of a connector in order to quickly achieve the required soldering temperature at the contact ends of the contact elements.

The contact elements 40 disclosed in Pape are inserted “into accommodations 32 in the segments 30” (col. 4, lines 39-42). Contact elements 40 are therefore spaced apart by solid material shown between accommodations 32, which do not promote air flow across the contact elements 40. Channel 5 is formed at the root of contact springs 41 and does not promote air flow across upper and lower surfaces of the conductors. Partial channel 7 is formed between recess 31 and intermediate wall 21 (col. 5, lines 5-8). Partial channel 8 is formed by the printed circuit board and an outer wall 23 of intermediate wall 21 (col. 4, lines 23-28). Therefore, the air in channels 5, 7, and 8 do not flow across an upper and lower surface of the contact elements 40 disclosed in Pape.

Claim 17 has been amended to recite

“An air flow control device for cooling a circuit board power connector, comprising:

...conductors arranged to direct the air through the power connector in channels exposing a majority of a surface area of the conductors.”

The air flow in Pape is not directed by conductors through channels exposing a majority of the surface area of the conductors. Rather Pape discloses a channel 5 formed at the root of contact springs 41, or alternatively a channel 6 or 7 that includes a recess 31 only

partially exposing contact elements 40. A majority of the surface area of contact elements 40 is adjacent intermediate wall 21 and segment 30 and therefore not exposed.

Claims 3-4, 7, 18 and 29-31 have been amended to more clearly recite other novel aspects that are not disclosed in Pape. For example,

Claim 3 recites a connector including:

“...openings on opposite sides of the housing for passing air through a first one of the openings, over the upper and lower surfaces of the conductors in parallel planar passageways.”

Claim 4 recites a connector including:

“an air flow control device configured to direct air through openings in a circuit board and into one of the housing openings.”

Claims 29-31 recite a connector:

“including parallel airways formed between the upper and lower surfaces of the conductors for channeling the air flow”... “that extend through the housing”... and expose a majority of a surface area of the conductors.”

Claims 3-4, 7, 18 and 29-31 are allowable for the same or similar reasons as discussed above, in addition to those reasons provided in support of claims 1 and 17.

Claim 32 has not been amended. Applicant respectfully traverses the rejection of claim 32. Claim 32 recites a connector:

“wherein the conductors are arranged as vertically stacked blades spaced apart by horizontal channels extending from the first side of the housing to the second side of the housing, the first and second openings allowing air to pass in through the opening on the first side of the housing.”

The contact elements 40 disclosed in Pape are inserted “into accommodations 32 in the segments 30” (col. 4, lines 39-42). Contact elements 40 are therefore spaced apart by solid material shown between accommodations 32, and not horizontal channels. There are no horizontal channels allowing air to pass through the housing in the Pape reference.

Claims 5-6, 9-11, 14, 21 and 24 stand rejected under 35 U.S.C. 103(a) according to Pape et al. (U.S. Patent No. 6,514,103) in view of Kramer et al. (U.S. Patent No. 6,574,108).

Applicant respectfully traverses the rejection. Claim 5 has not been amended.

Claim 5 recites a connector wherein:

"the air flow control device includes an air intake vent configured to direct air from underneath a circuit board up through vias electrically connected to a circuit board and into one of the housing openings."

Neither Pape nor Kramer disclose directing air from underneath a circuit board up through vias, and in fact Kramer does not disclose using airflow in any manner. Kramer discloses a means of *conducting* heat "away from thermal vias to the heat sink layer" (summary of the invention, col. 2 lines 36-40). Conduction describes the transmission of heat through a conducting medium without perceptible motion of the medium itself. Kramer therefore does not disclose the transfer of heat through air flow. Kramer furthermore discloses connecting mounting contacts 180 to vias 130 and 140 (col. 3, lines 25-27), teaching away from directing air from underneath the circuit board up through the vias. Claims 5-6, 9-11, 14, 21 and 24 are distinguishable from Pape in view of Kramer for the same or similar reasons as described above.

Claims 2, 8, 15, 16, 19 and 21-28 stand rejected under 35 U.S.C. 103(a) according to Pape et al. (U.S. Patent No. 6,514,103) in view one or more various other references..

Applicant has amended claims 2, 8, 15, 16, 19 and 21-28 to include the same or similar features as described above. Applicant therefore believes all claims as amended are now in a condition for allowance.


For the foregoing reasons, reconsideration and allowance of claims 1-12 and 14-32 of the application as amended is solicited. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

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Respectfully submitted,

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